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ABSTRACT

The portfolio approach to evaluation can be a useful method of screening and comparing educational programs in terms of their productivity and potential. In the field of investments, portfolio analysis consists of identifying the relative strengths of assets in terms of the dimensions of return and potential for growth. College programs can be assessed in similar ways. Productivity can be measured in terms of enrollment and capacity; yield measures of income and expense; and student retention rates. Potential can be measured in terms of current market demand, job placement, enrollment demand, graduation rates, and local and national employment opportunities. These measures can be expressed through the following equations: Productivity = Efficiency * Yield * Persistence; and Potential = Market Demand * Job Field Trends. If customized to fit the values and environmental characteristics of the college, this approach can identify programs that should be evaluated in depth, and illuminate operating problems. Seven charts which illustrate the use of the portfolio approach to evaluate and compare 34 programs are included. (VVC)

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APPLYING PORTFOLIO EVALUATION CONCEPTS TO EDUCATIONAL PROGRAM SCREENING

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ABSTRACT

A method of screening educational programs and comparing them with one another in terms of the strength of outcomes may be required by policies of individual institutions or college systems.

Such requirements for program evaluation generally call for measurement against values of the institution. Two values of importance to institutions in times of limited resources are program productivity and future potential. These are similar to values used in evaluations of, for instance, investment portfolios, products, and personnel.

The evaluation approach discussed uses "productivity" and "potential" as broad dimensions for assessing program worth, and for comparison of several programs. Each of these dimensions is defined in terms of underlying factors and their associated variables. Equations establish relationships among variables and indices are generated. The indices are used to locate programs in a common two-dimensional space which suggests their relative strength on the two dimensions of productivity and potential.

Measures related to the variables in the model and considerations which may be necessary to adapt them to differing institutional requirements are addressed. The use of resulting outputs, and the setting of criteria to use in determining the necessity for more detailed study of specific programs, are also discussed.

Application results are used to illustrate the discussion.

INTRODUCTION

Faced with limited resources, multiple demands, and tight budgets, most colleges and universities use some form of program evaluation to assess operating results, to identify problem areas, and to suggest changes in resource allocation.

Many institutions include some sort of periodic screening in their evaluation procedures to determine if more intensive, in-depth evaluation efforts are needed.

Screening usually assesses results in relation to performance parameters such as student attraction/enrollment, placement, or cost efficiency. Frequently, it is used in planning and in making operating decisions. For example, programs or services which are inordinately expensive or which yield marginal results may become candidates for revision, for scaled back levels of effort, or for termination.

A portfolio approach to evaluation can be especially helpful in limited resource situations.

One benefit of the portfolio approach is the treatment of programs as assets which can be collectively compared against common criteria which reflect short and long term interests of the institution. Another benefit is that it can help focus management attention on critical issues and aid decision making regarding marginal performers in the portfolio.

An implementation of the portfolio approach in screening the performance of educational programs is discussed herein.

PORTFOLIO APPROACHES TO EVALUATION

Portfolio analysis is rooted in asset investment where analysts focus on developing a balance of investments which matches the needs or interests of the investor. Commonly, the needs or interests of the investor are defined in terms of values such as "return on investment" and "potential for future growth."

Analysis of the portfolio, then, consists of identifying all assets in terms of their relative strength on these basic dimensions of "return" and "potential for growth."

Cast in a simple 2 dimensional matrix of "high" and "low" values, each investment can be characterized for subsequent decision making. For instance, a "low-low" analysis would likely lead the rational investor to a sell decision. A

"high-high" analysis would likely lead to retention in the portfolio. A "high" return and "low" growth potential asset is likely to be retained where immediate returns are valued, and a "low" return and "high" growth potential asset is likely to be retained where asset appreciation is the objective.

Portfolio approaches have also been applied to the analysis of the relative value of products produced, inventoried, or sold by a company. The classic product-analysis model of the Boston Consulting Group analyzed products in a company's portfolio with respect to the underlying values of "market share" and "market growth."

The product-analysis model was applied to the analysis of personnel performance by George Odiorne, who related it to the MBO (management by objectives) approach which he was instrumental in developing and promoting. The employee performance model of Odiorne is based upon the underlying values of "performance" and "potential." In it an employee rated "low-low" is characterized as "deadwood" while a "high-high" rated employee is considered a "star." A "low" potential but "high" performance employee is considered a "workhorse" and a "high" potential but "low" performance employee is "problem child."

Subsequently, William Pfeiffer equated the "performance" dimension to the concept "productivity" and redefined the categories and area of the matrix and created a methodology for use in employee evaluation and development.

These two underlying dimensions (productivity and potential) form the basis for the program screening approach which is the subject of this discussion.

A PORTFOLIO APPROACH TO PROGRAM SCREENING

The portfolio approach to screening which follows supports an institutional management system which integrates MIS, research and evaluation efforts.

The management information, evaluation, and research efforts of the institution are structured to yield information for strategic planning, operational planning, budgeting, and management. They are also structured to provide the information required for a three-phased evaluation approach involving: (1) annual monitoring and screening of programs and services of the college; (2) in-depth evaluation of programs or services based upon unacceptable screening outcomes or scheduled periodic in-depth review; and (3)

impact assessment, which includes remedial actions based on in-depth evaluation results, studies such as the placement of graduates in program related jobs, or other evidence of the impact of educational operations.

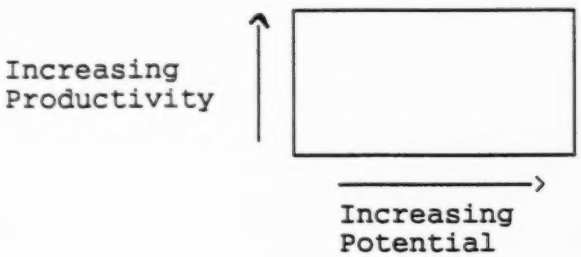
A. The Portfolio Based Screening Model and Process

"Productivity" and "Potential" are the key dimensions used in screening to suggest possible need for in-depth evaluation and decisions to continue, modify, or terminate programs.

Several factors and their underlying variables define the scope of the model:

PROGRAM PRODUCTIVITY	(dimension)	(d)
- Program Efficiency	(factor)	(f)
-enrollment	(variable)	(v)
-capacity		(v)
- Program Yield		(f)
-income		(v)
-expense		(v)
- Program Persistence		(f)
-program persisters		(v)
-program enrollees		(v)
PROGRAM POTENTIAL		(d)
- Current Market Demand		(f)
-placement in field of training		(v)
-number of graduates		(v)
-enrollment demand		(v)
- Job Field Trend/Future		(f)
-district		(v)
-state		(v)
-national		(v)

Using the two dimensions, the relative strengths of programs may be quantified and plotted in a manner which allows the comparison of programs in relation to increasing levels of "productivity" and "potential":



The equations for the model specify the relationships among the variables:

1) Program Productivity Measures

Program Productivity (PP) is a function of:
- Program Efficiency (PE)
- Program Yield (PY)
- Program Persistence Rate (PPR)

or PP = PE * PY * PPR

Each of these is defined/quantified as follows:

Program Efficiency (PE) = enrollment / capacity

where:

enrollment = total enrollment in courses unique to the program
capacity = total capacity of courses unique to the program

Program Yield (PY) = (income/expense)/highest yield

where:

income = the sum of (1) tuition and fees, (2) state aids, and (3) average cost per student credit hour of such programs to the district.
expense = the sum of (1) direct instructional costs, and (2) a proration of instructional and institutional overhead.
highest yield = highest income to cost ratio of all programs

Program Persistence Rate (PPR) = persisters/enrollees

where:

persisters = total persons who have enrolled in a program within a period equal to two times the length of the program, who (1) graduated from the program, or (2) have been enrolled in and completed at least one course during the most recent school year.
enrollees = total persons enrolled in a program in a period equal to two times the length of the program, less those who (1) are currently enrolled in another program, (b) have graduated from another program, or

(c) have jobbed-out or achieved another desired result.

2) Program Potential Measures

Program Potential (PPT) is a function of:
-Current Market Demand (CMD)
-Job Field Trend/Future (JFT)
or PPT = CMD * JFT

Each of these is defined/quantified as follows:

Current Market Demand (CMD) =
(placement/graduates) * enrollment demand

where:

placement = graduates placed in the field or closely related field at 6 month follow-up study
graduates = total persons graduating from the program in the year corresponding to the 6 month study
enrollment demand is determined by the scale:
1.0 = annual enrollment plus wait list is over 100% of program capacity
.9 = enroll plus wait list is 90-100%
.75 = enroll plus wait list is 80-89%
.6 = enroll plus wait list is 70-79%
.45 = enroll plus wait list is 60-69%
.1 = enroll plus wait list under 60%

Job Field Trend/Future (JFT) =
district score + state score + national score

where:

district score = district rating * .5

state score = state rating * .3

national score = national rating * .2

and the rating scale is:
1.0 = rapidly expanding
.9 = expanding
.8 = stable
.5 = declining
.1 = rapidly declining

3) Plotting Relative Strength of Programs

The equations related to "productivity" and "potential" yield indices on a scale of 0 to 1 based upon data related to their underlying factors and variables (i.e., the Productivity Index is a function of Program Efficiency, Program Yield and Program Persistence).

Expressed as an equation, Productivity = Efficiency * Yield * Persistence. Using a threshold index of .6 for acceptable productivity on each of the factors produces a minimum Productivity Index of .6 * .6 * .6 = .216. Similarly, Potential = Market Demand * Job Field Trend, and scores of .6 on each of the factors produces a Potential Index of .36. These two values (Productivity Index = .216 and Potential Index = .36) establish the parameters for strong consideration of programs as a candidate for in-depth evaluation.

The resulting two indices for each program are then plotted to reflect the relative strengths of programs.

4) Presenting and Analyzing Screening Data

Spreadsheets and charts are used to present data:

1 - Summary of Program Screening
2 - Program Efficiency Index
3 - Program Yield Index
4 - Program Persistence Index
5 - Current Market Demand
6 - Job Field Trends
7 - Relative Strengths of Programs

Sample outputs are presented in charts 1 through 7.

The Summary of Program Screening (Chart 1) contains the indices calculated in Charts 2, 3, 4, 5, and 6. It also contains the Dimension indices for Program Productivity and Program Potential.

Program performance data related to the various indices are presented in the Charts 2 through 6. The various program's indices are plotted in the chart of "Relative Strengths of Programs" (Chart 7).

In the sample data, twelve programs (2, 3, 9, 10, 16, 19, 21, 22, 23, 25, 27, 28) appear to be candidates for in-depth evaluation) Four of the programs (2, 9, 10, and 12, all long-term programs generally serving older, employed persons) lack either program capacity

specifications or graduate and placement data. As a result, Program Potential indices do not compute. However, each of these programs is rated high (.8 or better on a scale of 1) in terms of Job Field Index. These programs are plotted at the zero position on the Program Potential axis of the graph showing relative strengths of programs (Chart 7) although their true potential probably exceeds the Potential Index parameter value (.36).

As mentioned previously, a Productivity Index value of .216 and a Potential Index value of .36 establish the parameters for strong consideration of programs for in-depth evaluation. The programs falling within these parameters receive consideration for in-depth evaluation (Chart 7).

Three of the programs (9, 10, and 21) falling within these parameters are long term programs populated by employed persons. For that reason, variables in the Potential Index relating to placement, which do not apply, result in a score below the parameter value for the Potential Index. This, combined with a Productivity Index score below the parameter value, automatically flags them for consideration for in-depth evaluation. However, these program are more appropriately identified as having acceptable Potential and low Productivity Indices.

The Productivity Index for programs 9, 10, and 21 is depressed by combined low Persistence, Efficiency and Yield scores. The low Persistence scores can be attributed in part to the propensity of the employed persons usually enrolled having "course" rather that "program" interests. The low Yield scores reflect increased costs per student credit hour from the previous year. The low Efficiency scores may be attributed to inflated course capacities associated with open.lab courses.

Based upon these considerations, programs 9, 10, and 21 were not scheduled for In-Depth evaluation but were included among programs to receive internal management review related to their productivity.

Of the remaining eight programs for which in-depth evaluation is strongly indicated, four were not recommended for in-depth evaluation since each had received in-depth evaluations the previous year and changes had been made which were expected to improve future performance. Two additional programs were excluded from in-depth evaluation since one was in the process of being phased out, and the other had received recent internal management review and

improvements made which should be implemented and tested.

The remaining two programs of the twelve were scheduled for in-depth evaluations along with several others which were on a standard rotation list or were scheduled for a special certification/accreditation evaluation.

In addition, based on low Productivity indices, (.216 on a scale of 1), eleven programs (12, 14, 17, 18, 24, 26, 29, 30, 31, 32, 33) were scheduled to receive management reviews which might lead to future in-depth evaluations.

B. Customizing the Portfolio Approach to Program Evaluation

The portfolio approach should be customized to fit the values of the institution. While a case may be made for the two basic dimensions...productivity and potential...the factors and variables selected might vary widely based upon situational conditions of institutions.

For instance, in the approach presented, program efficiency was emphasized as well as program yield (which focuses on cost and income.) Such a focus is necessary where an institution faces severely limited resources. In this case, the capacity and enrollments in program specific courses gives the opportunity to place emphasis on resource utilization in overall evaluation. Similarly, in the case of Job Field Trends, special emphasis is placed upon satisfying the labor force needs of employers in the district served by the college. Other institutions have varying interests in serving specific areas of the nation.

C. Addressing Special Agendas; Identifying Operating Problems

Just as the dimensions, factors and variables selected in the portfolio approach can permit focusing on special agendas, as suggested above in the case of resource utilization, the approach can also illuminate operating problems and focus attention on the necessity of addressing them.

For instance, in Chart 2, program 9 indicates a capacity of serving 1497 students in 1988-89 while actual enrollment was 292. A clear case of poor resource utilization seems apparent. However, a single teacher served this program through several dispersed campus sites utilizing mediated materials combined with one-on-one conferences.

In reality, the problem is a scheduling and administrative problem, and the program efficiency index should be well

above the .6 threshold which was set.

Similarly, while the charts presented do not illustrate it, the "capacity" of sections of the same course were found to vary widely in some cases and raised the question of scheduling and administrative consistency. In some cases the differences were reasonable, in others the data revealed changes in "capacities" of section to spread the number of available students across the number of sections which were scheduled. While the Program Efficiency Index in such cases might be high due to near equal capacities and enrollments, resource utilization measured against capacities based upon good educational practice could be very low.

SUMMARY

The portfolio approach to screening educational programs and comparing them with one another can provide a useful tool for educational managers and decision makers.

Focusing on values such as program productivity and program potential are particularly relevant in times of limited resources, and the portfolio approach can comfortably accommodate them.

The evaluation approach discussed uses "productivity" and "potential" as broad dimensions for assessing program worth, and for comparison of several programs. Through a series of equations, factors and variables underlying the dimensions are used to generate indices which are used to locate programs in a common two-dimensional space.

The process can be accomplished using data normally captured in daily institutional operations. The results may be used to spark further in-depth studies of specific programs, or may be used in management decision making and interventions.

The model should be designed to fit the value structures, operating imperatives, and management approaches of the individual institution or system.

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Chart 1
SUMMARY PROGRAM SCREENING 1988-89

PROGRAM	LENGTH	A PROGRAM PERSISTENCE INDEX	B PROGRAM EFFICIENC INDEX	C PROGRAM YIELD INDEX	D MARKET DEMAND INDEX	E JOB FIELD TREND INDEX	(A*B*C) F PRODUC-TIVITY INDEX	(D*E) G PROGRAM POTENTIAL INDEX
1	2	0.70	0.509	0.64	0.63	0.80	0.23	0.50
2	5	0.09	0.741	3.36	ERR	0.80	0.23	ERR
3	2	0.57	0.418	0.48	0.05	0.85	0.12	0.04
4	2	0.68	0.568	0.70	0.87	0.80	0.27	0.70
5	2	0.75	0.631	0.49	0.92	0.83	0.23	0.77
6	2	0.83	0.905	0.82	1.00	0.80	0.62	0.80
7	2	0.81	0.594	0.82	0.91	0.85	0.40	0.77
8	2	0.72	0.580	0.61	0.77	0.80	0.26	0.61
9	5	0.80	0.195	0.35	ERR	0.85	0.05	ERR
10	5	0.60	0.410	0.56	ERR	0.80	0.14	ERR
11	2	0.80	0.895	1.00	0.57	0.80	0.72	0.46
12	2	0.90	0.693	0.29	0.95	0.90	0.18	0.86
13	2	0.91	0.875	0.44	1.00	0.90	0.35	0.90
14	2	0.90	0.661	0.24	1.00	0.90	0.14	0.90
15	2	0.77	0.736	0.50	1.00	0.87	0.28	0.87
16	2	0.77	0.456	0.42	0.28	0.65	0.15	0.18
17	2	0.75	0.530	0.38	0.69	0.90	0.15	0.62
18	2	0.71	0.556	0.52	0.68	0.90	0.21	0.62
19	2	0.77	0.393	0.37	0.40	0.82	0.11	0.32
20	2	0.85	0.825	0.47	0.80	0.65	0.33	0.52
21	5	0.63	0.533	0.49	ERR	0.80	0.16	ERR
22	1	0.73	0.406	0.34	0.05	0.80	0.10	0.04
23	1	0.58	0.316	0.37	0.06	0.56	0.07	0.04
24	1	0.81	0.465	0.46	0.62	0.90	0.17	0.55
25	1	0.65	0.216	0.55	0.08	0.65	0.08	0.05
26	1	0.74	0.452	0.36	0.80	0.80	0.12	0.64
27	2	0.60	0.620	0.53	0.08	0.85	0.20	0.07
28	2	0.75	0.261	0.33	0.18	0.80	0.06	0.14
29	1	0.78	0.593	0.32	0.60	0.80	0.15	0.48
30	1	0.69	0.576	0.34	0.64	0.83	0.14	0.53
31	2	0.61	0.461	0.37	0.60	0.80	0.10	0.48
32	2	0.73	0.514	0.39	0.65	0.85	0.15	0.55
33	2	0.66	0.740	0.29	0.68	0.80	0.14	0.54
34	2	0.75	0.611	0.48	0.90	0.90	0.22	0.81

Chart 2

PROGRAM EFFICIENCY INDEX 1988-1989

PROGRAM	PRG LENGTH	A 1986-87 CAPACITY	B 1986-87 ENROLLMENT	C INDEX (B/A)	D 1987-88 CAPACITY	E 1987-88 ENROLLMENT	F INDEX (E/D)	G 1988-89 CAPACITY	H 1988-89 ENROLLMENT	I INDEX (H/G)
1	2	702	366	0.521	668	398	0.596	721	367	0.509
2	5	178	99	0.556	147	83	0.565	58	43	0.741
3	2	249	141	0.566	192	81	0.422	182	76	0.418
4	2	550	459	0.835	650	350	0.538	713	405	0.568
5	2	143	124	0.867	169	123	0.728	122	77	0.631
6	2	170	128	0.753	182	120	0.659	126	114	0.905
7	2	352	227	0.645	383	221	0.577	429	255	0.594
8	2	495	333	0.673	465	311	0.669	584	339	0.580
9	2	570	47	0.082	2064	235	0.114	1497	292	0.195
10	2	130	67	0.515	335	195	0.582	743	305	0.410
11	2	418	379	0.907	425	388	0.913	362	324	0.895
12	2	342	298	0.871	328	266	0.811	332	230	0.693
13	2	100	82	0.820	282	256	0.908	562	492	0.875
14	2	104	81	0.779	106	90	0.849	124	82	0.661
15	2	220	150	0.682	260	142	0.546	295	217	0.736
16	2	450	296	0.658	384	246	0.641	432	197	0.456
17	2	521	266	0.511	589	238	0.404	498	264	0.530
18	2	460	325	0.707	528	311	0.589	550	306	0.556
19	2	501	308	0.615	480	311	0.648	540	212	0.393
20	2	324	257	0.793	315	258	0.819	315	260	0.825
21	5	76	31	0.408	96	52	0.542	137	73	0.533
22	1	178	87	0.489	184	88	0.478	219	89	0.406
23	1	449	138	0.307	411	126	0.307	339	107	0.316
24	1	1252	857	0.685	1420	795	0.560	1660	772	0.465
25	1	62	37	0.597	51	32	0.627	134	29	0.216
26	1	37	18	0.486	91	27	0.297	126	57	0.452
27	2	119	68	0.571	118	58	0.492	234	145	0.620
28	2	230	94	0.409	333	102	0.306	333	87	0.261
29	1	109	49	0.450	93	41	0.441	108	64	0.593
30	1	200	66	0.330	144	75	0.521	144	83	0.576
31	2	44	25	0.568	55	37	0.673	102	47	0.461
32	2	394	198	0.503	398	211	0.530	403	207	0.514
33	2	204	183	0.897	210	181	0.862	200	148	0.740
34	2	288	176	0.611	328	184	0.561	437	267	0.611

Chart 3

PROGRAM YIELD INDEX 1988-89

PROGRAM	A COST/SCH TECH CORE ($)	B INCOME TUIT/FEE STATE AID	C DISTRICT COST/SCH ($)	D INCOME/SCH (AVG DIST AID/SCH)	E PROGRAM YIELD (D-A)	F PROGRAM YIELD INDEX	G ADJ. PRM YLD INDX (F/P45)	H 88-89 ADJ. PRM YLD INDX (F/1.95)	I 87-88 ADJ. PRM YLD INDX (F/1.98)
1	145.19	77.95	67.24	256.83	111.64	1.77	0.70	0.91	0.83
2	0.00	0.00	0.00	178.88	178.88	0.00	0.00	0.00	1.38
3	198.86	94.12	104.74	273.00	74.14	1.37	0.55	0.70	0.70
4	196.74	94.04	102.70	272.92	76.18	1.39	0.55	0.71	0.86
5	250.27	111.31	138.96	290.19	39.92	1.16	0.46	0.59	0.78
6	137.42	76.37	61.05	255.25	117.83	1.86	0.74	0.95	0.68
7	130.22	74.81	55.41	253.69	123.47	1.95	0.78	1.00	0.85
8	156.29	80.79	75.50	259.67	103.38	1.66	0.66	0.85	0.97
9	249.44	110.71	138.73	289.59	40.15	1.16	0.46	0.60	0.49
10	152.34	80.67	71.67	259.55	107.21	1.70	0.68	0.87	0.72
11	96.19	62.79	33.40	241.67	145.48	2.51	1.00	1.29	1.00
12	638.57	233.00	405.57	411.88	-226.69	0.65	0.26	0.33	0.38
13	380.39	149.77	230.62	328.65	-51.74	0.86	0.34	0.44	0.46
14	749.93	265.14	484.79	444.02	-305.91	0.59	0.24	0.30	0.31
15	219.24	99.74	119.50	278.62	59.38	1.27	0.51	0.65	0.41
16	264.56	116.98	147.58	295.86	31.30	1.12	0.45	0.57	0.65
17	320.92	131.99	188.93	310.87	-10.05	0.97	0.39	0.50	0.39
18	233.24	106.91	126.33	285.79	52.55	1.23	0.49	0.63	0.65
19	310.98	130.98	180.00	309.86	-1.12	1.00	0.40	0.51	0.65
20	212.50	102.11	110.39	280.99	68.49	1.32	0.53	0.68	0.63
21	220.05	100.94	119.11	279.82	59.77	1.27	0.51	0.65	0.56
22	327.40	135.18	192.22	314.06	-13.34	0.96	0.38	0.49	0.57
23	343.66	140.24	203.42	319.12	-24.54	0.93	0.37	0.48	0.42
24	222.47	100.78	121.69	279.66	57.19	1.26	0.50	0.64	0.55
25	302.72	134.84	167.88	313.72	11.00	1.04	0.41	0.53	0.51
26	337.46	136.96	200.50	315.84	-21.62	0.94	0.37	0.48	0.50
27	389.40	156.97	232.43	335.85	-53.55	0.86	0.34	0.44	0.48
28	503.48	176.93	326.55	355.81	-147.67	0.71	0.28	0.36	0.35
29	278.83	130.14	148.69	309.02	30.19	1.11	0.44	0.57	0.37
30	377.84	151.73	226.11	330.61	-47.23	0.88	0.35	0.45	0.37
31	1068.71	365.00	703.71	543.88	-524.83	0.51	0.20	0.26	0.56
32	300.90	132.77	168.13	311.65	10.75	1.04	0.41	0.53	0.53
33	469.47	181.78	287.69	360.66	-108.81	0.77	0.31	0.39	0.40
34	243.49	102.75	140.74	281.63	38.14	1.16	0.46	0.59	0.47
sum	10429.17	4347.19	6081.98						
average	306.74	127.86	178.88						
MAX VALUE						2.51			

Chart 4

PROGRAM PERSISTENCE 1988-1989

A	B	C	D	E	F	G	H	I	J	K	L	M	N
PRGM	PRGM LENGTH (YEARS)	X-YEARS ENROLLEES (Bx2)	CURRENTLY IN OTHER PROGRAM	CURRENTLY ENROLLED IN PRGM	GRAD FROM PROGRAM	GRAD FROM OTHER PROGRAM	JOB OUT/ TRANSFER INSTIT.	DROP PGM (REASON UNKNOWN)	% DROPPED PROGRAM	TRANSFER & DROP (REASON UNKNOWN)	PROGRAM ENROLLEES C-(D+G+K)	PROGRAM PERSISTERS (E+F)	PROGRAM PERSIST. INDEX (M/L)
1	2	538	30	214	124	22		143	28.15	5	481	338	0.70
2	5	12	1	1	0	0		10	90.91	0	11	1	0.09
3	2	64	1	21	14	2		26	41.27	0	61	35	0.57
4	2	492	12	181	135	6		151	31.46	7	467	316	0.68
5	2	142	4	47	50	7		33	23.91	1	130	97	0.75
6	2	135	11	57	40	6		20	16.13	1	117	97	0.83
7	2	140	7	63	42	2		24	18.05	2	129	105	0.81
8	2	375	25	135	110	9		93	26.57	3	338	245	0.72
9	2	57	2	41	0	4		10	18.18	0	51	41	0.80
10	5	85	2	42	6	2		32	38.55	1	80	48	0.60
11	2	165	5	69	56	2		31	19.38	2	156	125	0.80
12	2	119	1	42	63	1		12	10.17	0	117	105	0.90
13	2	381	1	157	182	5		35	9.21	1	374	339	0.91
14	2	60	1	30	23	0		6	10.17	0	59	53	0.90
15	2	132	4	62	34	3		28	21.88	1	124	96	0.77
16	2	233	8	63	109	2		50	22.22	1	222	172	0.77
17	2	127	3	53	37	1		30	24.19	3	120	90	0.75
18	2	200	2	86	53	1		57	28.79	1	196	139	0.71
19	2	169	7	61	60	5		36	22.22	0	157	121	0.77
20	2	195	5	76	82	4		27	14.21	1	185	158	0.85
21	5	42	2	20	4	1		14	35.00	1	38	24	0.63
22	1	115	5	35	44	1		29	26.36	1	108	79	0.73
23	1	131	2	14	57	5		51	39.53	2	122	71	0.58
24	1	304	9	160	76	4		54	18.31	1	290	236	0.81
25	1	82	6	17	31	2		26	34.21	0	74	48	0.65
26	1	94	2	30	37	0		24	26.09	1	91	67	0.74
27	2	74	8	16	21	3		25	37.88	1	62	37	0.60
28	2	57	1	21	17	2		13	23.21	3	51	38	0.75
29	1	83	6	28	32	0		17	22.08	0	77	60	0.78
30	1	83	2	28	26	1		24	29.63	2	78	54	0.69
31	2	64	3	18	18	1		23	37.70	1	59	36	0.61
32	2	155	4	55	53	2		39	25.83	2	147	108	0.73
33	2	129	8	44	32	4		40	33.06	1	116	76	0.66
34	2	170	8	66	52	3		40	24.69	1	158	118	0.75
		5404	198	2053	1720	113	0	1273		47	5046	3773	

Chart 5

MARKET DEMAND 1988-1989

PROGRAM	PRGM LENGTH (YEARS)	A PLACEMENT IN FIELD	B NUMBER GRADS	C PROGRAM CAPACITY	D ENROLLMT + WAIT LIST	E PERCENT (D/C)	F DEMAND RATING	88-89 G MKT DEM INDEX (A/B*F)	87-88 H MKT DEM INDEX (A/B*F)
1	2	25	40	104	112	1.08	1	0.63	0.83
2	5	*	*	*	1	ERR	ERR	ERR	ERR
3	2	2	4	30	9	0.30	0.1	0.05	0.05
4	2	34	39	96	107	1.11	1	0.87	0.66
5	2	12	13	24	27	1.13	1	0.92	0.78
6	2	8	8	24	32	1.33	1	1.00	0.87
7	2	10	11	24	42	1.75	1	0.91	0.95
8	2	23	27	72	71	0.99	0.9	0.77	0.89
9	2	*	*	*	32	ERR	ERR	ERR	ERR
10	2	4	4	*	23	ERR	ERR	ERR	ERR
11	2	8	14	32	44	1.38	1	0.57	0.75
12	2	20	21	24	35	1.46	1	0.95	1.00
13	2	60	60	60	120	2.00	1	1.00	0.90
14	2	3	3	12	13	1.08	1	1.00	1.00
15	2	6	6	26	48	1.85	1	1.00	0.90
16	2	10	16	48	33	0.69	0.45	0.28	0.48
17	2	11	12	40	33	0.83	0.75	0.69	0.51
18	2	13	19	50	55	1.10	1	0.68	0.57
19	2	22	25	48	29	0.60	0.45	0.40	0.48
20	2	16	20	40	61	1.53	1	0.80	0.57
21	5	3	3	*	18	ERR	ERR	ERR	ERR
22	1	6	12	44	25	0.53	0.1	0.05	0.30
23	1	5	8	47	25	0.53	0.1	0.06	0.26
24	1	24	39	52	88	1.69	1	0.62	0.73
25	1	5	6	38	14	0.37	0.1	0.08	0.05
26	1	12	15	20	21	1.05	1	0.80	0.88
27	2	8	10	37	14	0.38	0.1	0.08	0.36
28	2	2	5	25	17	0.68	0.45	0.18	0.07
29	1	8	8	34	25	0.74	0.6	0.60	0.07
30	1	5	7	24	22	0.92	0.9	0.64	0.68
31	2	7	7	27	19	0.70	0.6	0.60	0.08
32	2	13	15	40	32	0.80	0.75	0.65	0.55
33	2	9	10	32	28	0.88	0.75	0.68	0.92
34	2	18	20	46	68	1.48	1	0.90	0.92

Chart 6

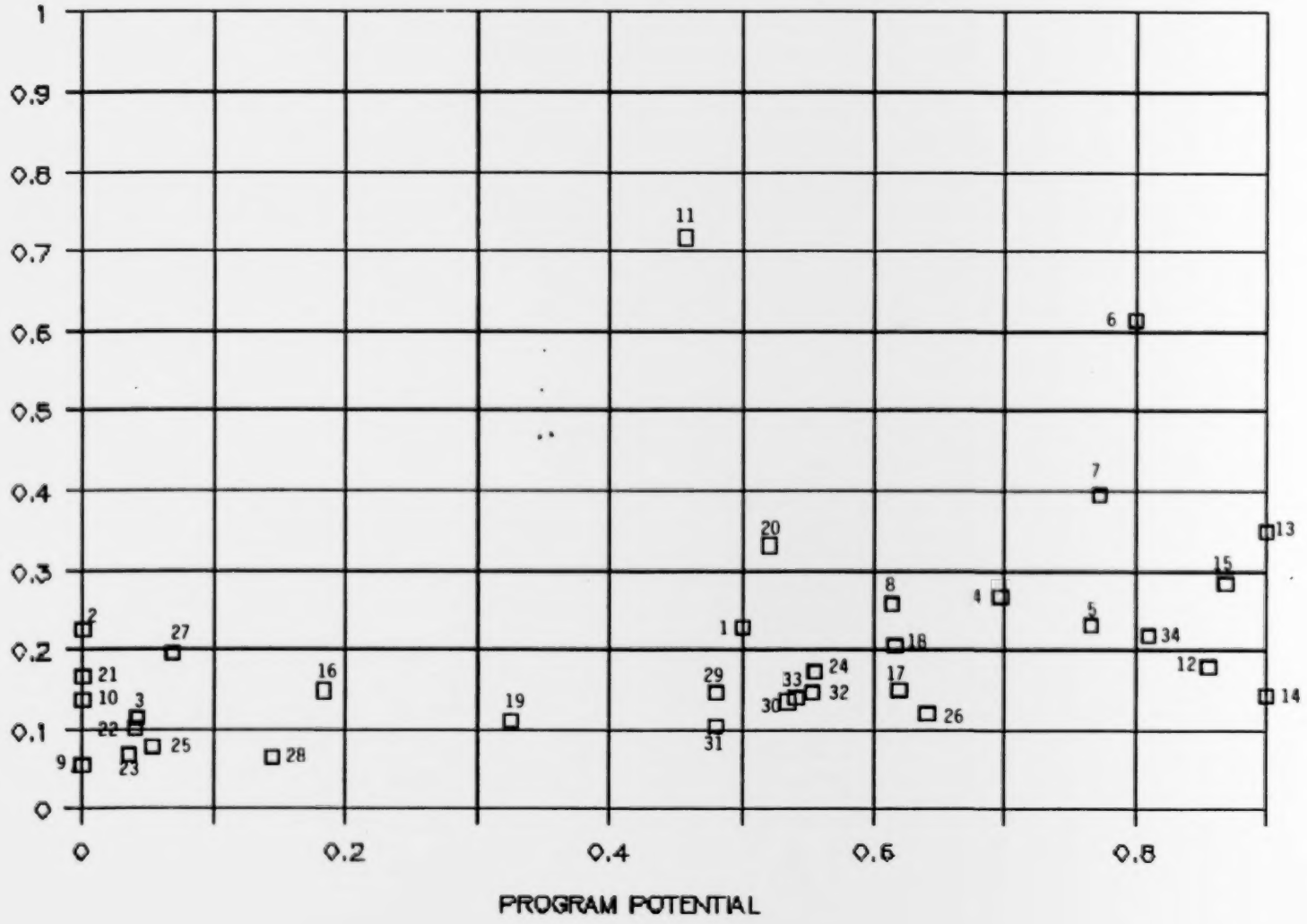
JOB FIELD TRENDS 1988-89

PROGRAM	PGM LENGTH	DIST. RATINGS	WISC. RATINGS	NATL RATINGS	District Score	WISC SCORE	NATL SCORE	88-89 Job Field Trend Index	87-88 Job Field Trend Index
1	2	3	3	3	0.8	0.8	0.8	0.80	0.80
2	5	3	3	3	0.8	0.8	0.8	0.80	0.80
3	2	3	4	4	0.8	0.9	0.9	0.85	0.85
4	2	3	3	3	0.8	0.8	0.8	0.80	0.59
5	2	3	4	3	0.8	0.9	0.8	0.83	0.85
6	2	3	3	3	0.8	0.8	0.8	0.80	0.80
7	2	4	3	3	0.9	0.8	0.8	0.85	0.85
8	2	3	3	3	0.8	0.8	0.8	0.80	0.80
9	2	3	4	4	0.8	0.9	0.9	0.85	0.92
10	2	3	3	3	0.8	0.8	0.8	0.80	0.80
11	2	3	3	3	0.8	0.8	0.8	0.80	0.80
12	2	3	5	5	0.8	1.0	1.0	0.90	0.98
13	2	4	4	4	0.9	0.9	0.9	0.90	0.90
14	2	3	5	5	0.8	1.0	1.0	0.90	0.90
15	2	3	4	5	0.8	0.9	1.0	0.87	0.98
16	2	2	3	3	0.5	0.8	0.8	0.65	0.56
17	2	4	4	4	0.9	0.9	0.9	0.90	0.85
18	2	4	4	4	0.9	0.9	0.9	0.90	0.88
19	2	3	3	4	0.8	0.8	0.9	0.82	0.80
20	2	2	3	3	0.5	0.8	0.8	0.65	0.65
21	5	3	3	3	0.8	0.8	0.8	0.80	0.90
22	1	3	3	3	0.8	0.8	0.8	0.80	0.50
23	1	2	2	3	0.5	0.5	0.8	0.56	0.80
24	1	4	4	4	0.9	0.9	0.9	0.90	0.80
25	1	2	3	3	0.5	0.8	0.8	0.65	0.56
26	1	3	3	3	0.8	0.8	0.8	0.80	0.85
27	2	3	4	4	0.8	0.9	0.9	0.85	0.85
28	2	3	3	3	0.8	0.8	0.8	0.80	0.80
29	1	3	3	3	0.8	0.8	0.8	0.80	0.88
30	1	3	4	3	0.8	0.9	0.8	0.83	0.82
31	2	3	3	3	0.8	0.8	0.8	0.80	0.83
32	2	3	4	4	0.8	0.9	0.9	0.85	0.80
33	2	3	3	3	0.8	0.8	0.8	0.80	0.83
34	2	4	4	4	0.9	0.9	0.9	0.90	0.85

1-rapid decline
2-decline
3-stable
4-expanding
5-rapid expansion

Chart 7

RELATIVE STRENGTHS OF PROGRAMS 1988–89



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